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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Tetsuya KAMIHARA

Title: FUEL CELL SYSTEM

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PRE-APPEAL BRIEF REQUEST FOR REVIEW

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Sir:

In accordance with the **Pre-Appeal Brief Conference Pilot Program**, announced July 11, 2005, this Pre-Appeal Brief Request is being filed together with a Notice of Appeal.

REMARKS

Rejection under 35 U.S.C. § 102

Claims 1, 3, 6, 14-16, and 19 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Pub. No. 2001/0014415 to Iio *et al.* (hereafter "Iio"). This rejection is respectfully traversed.

Iio discloses a fuel cell system that includes a hydrogen supply unit 2 that supplies hydrogen gas to a fuel cell stack 1 and an air supply unit 3 that supplies air to the fuel cell stack 1. See Iio at paragraph 0024. Iio discloses that the fuel cell system purges surplus moisture to optimize electric power output. See Iio at paragraphs 0003 and 0004. The

hydrogen supply unit 2 includes a reformer 6 that reforms fuel "to produce mixed gas of hydrogen and carbon monoxide," with the carbon monoxide removed by a CO remover 7 to provide "pure hydrogen gas." See Iio at paragraph 0025. This "pure hydrogen gas" flows from the CO remover 7 through a hydrogen gas supply passage Ph1 and a humidifier 9 to the fuel cell stack 1. See Iio at paragraphs 0025 and 0026. Iio discloses that "surplus hydrogen gas" not reacted in the fuel cell stack and surplus air respectively flow through passages Ph2, Pa2 to a combuster 4. See Iio at paragraph 0029. A hydrogen control valve 11 is provided in the exhaust hydrogen passage Ph2 to regulate a flow rate of "hydrogen gas" flowing through the exhaust hydrogen passage Ph2. See Iio at paragraph 0030.

Iio further discloses embodiments that include a second hydrogen control valve 14 to regulate a flow rate of surplus hydrogen gas to be supplied to a combustor 4 and a recirculation passage Ph3 to recirculate surplus hydrogen gas. See Iio at paragraphs 0052-0057 and Figures 5 and 6. More particularly, Iio discloses that the second hydrogen control valve 14 is controlled to be closed or have a reduced opening angle during normal operation and to have a temporarily increased opening degree when purging moisture. See Iio at paragraphs 0053 and 0057.

The Office indicates on page 3 of the Final Office Action that Iio is silent in regard to a controller being configured to adjust the valve opening degree of the purge valve such that a nitrogen concentration of the fuel gas in the recirculation system is controlled to be maintained at a target nitrogen concentration, as recited in claims 1 and 14. Applicant agrees.

However, the Office argues on page 3 of the Office Action that the device of Iio would inherently provide these features. In particular, the Office argues that the device of Iio would control nitrogen concentration to be maintained at a target nitrogen concentration because paragraph 0045 of Applicant's application (the Office appears to refer to paragraph 0045 of U.S. Pub. No. 2005/0244686, the publication of Applicant's application, which corresponds to page 10, lines 7-12, of Applicant's specification) discusses how hydrogen flow rate discharged through a purge valve can be controlled to a threshold and nitrogen concentration in a fuel recirculation system can be controlled to a <u>constant level</u> without using a nitrogen concentration sensor.

In other words, the Office appears to argue that because the device of Iio controls the flow of gas through a valve, such as the hydrogen control valve 11 and/or the second hydrogen control valve 14, that the device of Iio controls a flow rate of fuel in a fuel gas and controls a nitrogen concentration of the fuel gas in a recirculation system, as recited in claim 1. Applicant respectfully disagrees.

As noted above, Iio is silent in regard to this feature and does not disclose or suggest what level a target nitrogen concentration would be controlled to or how to maintain such a "constant level" of nitrogen concentration, such as to optimize the efficiency of a fuel cell. Instead, the Office improperly uses the disclosure of Applicant's own invention to insert features into the disclosure of Iio that are not disclosed or suggested by Iio, including what features are inherent in Iio, even though the teachings of Iio provide no basis for this feature or how the device of Iio would work to control nitrogen concentration of a fuel gas in a recirculation system, as recited in claims 1 and 14. Furhter, the Office appears to rely on possibilities or probabilities for a basis of inherency, which is not proper. See MPEP § 2112, Part IV. Applicant's invention advantageously controls a nitrogen concentration of a fuel gas in a recirculation system so that an amount of discharged fuel gas is suppressed to a minimum and fuel cell performance is enhanced.

Nor does Iio provide a controller configured to maintain a flow rate of fuel in a fuel gas passing through a purge valve at a threshold set in accordance with operation conditions of the fuel cell system and the valve opening degree of the purge valve, as recited in claim 1. Instead, the device of Iio provides "pure hydrogen gas" to the fuel cell stack and exhausts "surplus hydrogen gas" from the fuel cell stack of Iio, which is recirculated or combusted (emphasis added). See Iio at paragraphs 0025 and 0029. Because the device of Iio uses pure hydrogen gas and a surplus hydrogen gas exhausted from the stack, the device of Iio does not use "fuel in a fuel gas," as recited in claim 1, but instead uses hydrogen, or simply "fuel," instead of hydrogen in a fuel gas. As a result, the device of Iio does not provide "a fuel gas passing through the purge valve," as recited in claim 1, because the device of Iio instead passes surplus hydrogen gas through the second hydrogen control valve 14.

The Office suggests on page 10 of the Office Action that fuel gas is hydrogen but does not explain how fuel and fuel gas can also be different under this reasoning, as recited in

claim 1. Clearly, the language "fuel in a fuel gas" in claim 1 refers to "fuel" and "fuel gas" as being different, not both being hydrogen, and the Office's argument does not resolve this distinction in the language of claim 1.

As discussed in the response of November 9, 2009 and June 3, 2010, case law demonstrates that a special purpose machine or computer configured or otherwise programmed to perform a function is not anticipated by a general purpose machine or computer that lacks the same configuration or programming, and that it would not have been obvious to modify such a general purpose machine or computer to have the configuration or programming of a claimed special purpose machine or computer, absent a teaching or suggestion in the prior art to do so.

Here, the control unit 5 of Iio does not provide the structure of the controller recited in claims 1 and 14 because the control unit 5 of Iio is not configured to adjust the valve opening degree of the purge valve such that a nitrogen concentration of the fuel gas in the recirculation system is controlled to be maintained at a target nitrogen concentration. Iio provides no disclosure or suggestion to provide a controller with such a structure because, as noted on page 3 of the Office Action, Iio is silent in regard to this feature. Nor is the control unit 5 of Iio configured to maintain a flow rate of fuel in a fuel gas, as recited in claim 1. As a result, the control unit 5 of Iio is not structured to control a purge valve to control a nitrogen concentration of a fuel gas, as recited in claims 1 and 14, and a flow rate of a fuel in a fuel gas, as recited in claim 1.

For at least the reasons discussed above, Iio does not anticipate claims 1, 3, 6, 14-16, and 19 because Iio does not disclose all of the features of claims 1 and 14. Reconsideration and withdrawal of this rejection is respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 4, 5, 17, and 18 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Iio in view of U.S. Patent 5,605,770 to Andreoli *et al.* (hereafter "Andreoli") and U.S. Pub. No. 2002/0022167 to Herron (hereafter "Herron"). Claims 7 and 20 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Iio in view of U.S. Patent No. 6,063,515 to Epp *et al.* (hereafter "Epp"). Claims 8 and 21 are rejected under

35 U.S.C. § 103(a) as allegedly being unpatentable over Iio and Epp in view of Andreoli. Claims 9 and 22 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Iio in view of JP 2002-151116 to Nakao (hereafter "Nakao"). Claims 10 and 23 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Iio and Nakao in view of Andreoli. Claims 11, 12, 24, and 25 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Iio in view of U.S. Patent No. 6,096,449 to Fuglevand *et al.* (hereafter "Fuglevand"). These rejections are respectfully traversed. Andreoli, Herron, Epp, Nakao, and Fuglevand fail to remedy the deficiencies discussed above in regard to independent claims 1 and 14, from which claims 4, 5, 7-12, 17, 18, and 20-25 depend. Reconsideration and withdrawal of these rejections is respectfully requested.

Furthermore, even if Iio could have been combined with another reference that discloses a flow rate of a purge valve being controlled at a constant amount, such a combination would not maintain a constant nitrogen concentration because a hydrogen partial pressure in the recirculation passage would become too low or the amount of hydrogen discharged with nitrogen would be too much at a constant purge rate, which would adversely affect fuel cell performance, as discussed on page 6, lines 4-25, of Applicant's specification. Therefore, one of skill in the art would not have made such a modification.

CONCLUSION

In view of the foregoing, the Examiner has made an error and the rejections discussed above should be withdrawn.

Respectfully submitted,

Date November 8, 2010 By _____

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